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Gnetuhainin S, a New Resveratrol Dimer from *Gnetum hainanense*

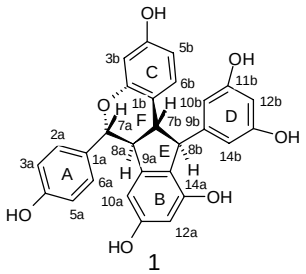
Shan ZHOU, Ying Hong WANG, Mao LIN*

Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050

Abstract: Gnetuhainin S, a new resveratrol dimer, was isolated from the lianas of *Gnetum hainanense* C. Y. Cheng. Its structure and relative configuration were established on the basis of spectroscopic evidence.

Keywords: Gnetuhainin S, *Gnetum hainanense*, Gnetaceae, resveratrol dimer.

In previous papers[1-3], eleven stilbene dimers, gnetuhainins A-J, P were isolated from the lianas of *Gnetum hainanense*. Continuous study on the same source led to the isolation of another new stilbene dimer, gnetuhainin S (**1**).



1

1 was obtained as colorless crystals, mp: 266-269°C, [α]$_D^{25}$ +17.112 (*c* 0.094, MeOH). The molecular formula $C_{28}H_{23}O_7$ [M+H]$^+$ of **1** was established from its high resolution FABMS *m/z* 471.1365 (requires 471.1444) with 18 degrees of unsaturation.

The ^{1}HNMR spectrum of **1** displayed a set of A_2B_2 system signals for ring A, two coupled doublet signals for ring B, a set of ABX system signals for ring C, a set of AB_2 system signals for ring D, and four coupled doublets for four connective methine protons (H-7a→H-8a→H-7b→H-8b). The HMBC spectrum (**Figure 1a**) showed siginificant CH longrange correlations between H-8a/C-9a,7a,7b,10a; H-7b/C-9b,1b,7a,8a; H-8b/C-9b,14a,1b,14b,10b,7b and H-7a/C-1a,2a,6a,7b which suggested that compound **1** was coupled by a resveratrol and an oxyresveratrol units through linkages forming ring E and ring F (shown in structure of **1**). In the NOESY spectrum (**Figure 1b**) the NOEs between H-8a/H-8b and H-8a/H-2a,6a indicated H-8a was in *cis* orientation of H-8b and *trans* to H-7a, and NOEs between H-7b/H-10(14)b, H-7b/H-7a, H-8b/H-6b,

H-8b/H-10(14)b and H-8b/H-8a suggested that H-7b was *trans* to H-8b and *cis* to H-7a respectively. Thus ring E and F were *trans* fused, showing a half chair form in the molecular model. The relative stereochemistry of **1** was established to be *rel*-(7aR, 8aR, 7bR, 8bR) and confirmed by X-ray crystallographic analysis[4]. It belongs to a novel type of oligostilbene by a resveratrol and an oxyresveratrol.

Figure 1 CH longrange corrections of **1** from the HMBC spectrum (a) and NOE interactions from the NOESY spectrum (b)

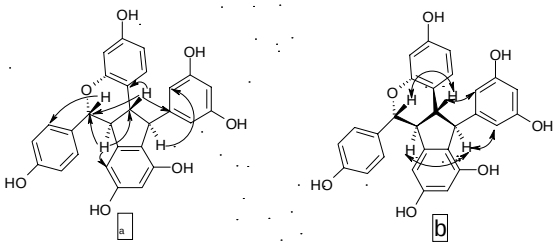


Table 1 ^{1}H and ^{13}C NMR spectral data for compound **1** (δ in ppm, *J* in Hz)[a]

Position	^{1}H	^{13}C	Position	^{1}H	^{13}C
1a		132.19	1b		118.47
2a	7.44, dd (8.4)	130.39	2b		158.49
3a	6.95, dd (8.4)	116.18	3b	6.26, d (1.8)	103.61
4a		157.92	4b		156.60
5a	6.95, dd (8.4)	116.18	5b	6.22, dd (8.7, 1.8)	107.53
6a	7.44, dd (8.4)	130.39	6b	6.98, d (8.7)	158.49
7a	5.38, d (10.2)	84.07	7b	3.46, t (10.2, 9.9)	53.60
8a	3.31, dd (10.2, 9.9)	51.05	8b	4.06, d (9.9)	51.94
9a		144.46	9b		146.81
10a	5.58, d (2.1)	103.89	10(14)b	6.54, d (2.1)	107.65
14a		124.22			
11a		158.63	11(13)b		159.85
13a		155.21			
12a	6.05, d (2.1)	102.69	12b	6.31, t (2.1)	102.21

δ 7.96 (11a-OH), 8.07 (2b-OH), 8.25 [11(13)b-OH], 8.59 (4a-OH)

[a]Measured in CD_3COCD_3 at 300 MHz for ^{1}HNMR, and 75 MHz for ^{13}CNMR,respectively.

References and Note

1. K. S. Huang, Y. H. Wang, R. L .Li , M. Lin, *J. Nat. Prod.*, **2000**, *63*, 86.
2. K. S. Huang, Y. H. Wang, R. L. Li , M. Lin, *Phytochemistry.*, **2000**, *54*, 875.
3. Y. H. Wang, K. S. Huang , M. Lin, *Chin. Chem. Lett.*, **2000**, *11*, 1061.
4. The data of X-ray crystallographic analysis were deposited to iditorial office CCL.

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